[FIG.1A]

INTENSITY

FREQUENCY

[FIG.1B]

INTENSITY

FREQUENCY

[FIG.1C]

INTENSITY

SUBSTITUTION

FREQUENCY

[FIG.1D]

INTENSITY

ADJUSTMENT OF SPECTRAL OUTLINE

FREQUENCY

[FIG.2A]

INTENSITY

FREQUENCY

[FIG.2B]

INTENSITY

FREQUENCY

[FIG.3A]

SUBSTITUTION

SUBBAND FOR SPECTRAL OUTLINE ADJUSTMENT

[FIG.4]

100 SPECTRUM CODING APPARATUS

104・105 FREQUENCY DOMAIN TRANSFORMATION SECTION

106 INTERNAL STATE SETTING SECTION

109 PITCH COEFFICIENT SETTING SECTION

107 FILTERING SECTION

108 SEARCH SECTION

110 FILTER COEFFICIENT CALCULATION SECTION

115 SECOND SPECTRUM ESTIMATED VALUE GENERATION SECTION

112 SPECTRAL OUTLINE ADJUSTMENT SUBBAND DETERMINING SECTION

113 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT CODING SECTION

111 MULTIPLEXING SECTION

[FIG.5]

INTERNAL STATE (FIRST SPECTRUM S1(k))

ESTIMATED VALUE OF SECOND SPECTRUM D2(k)

[FIG.6]

START

ST1010 SET T=TMIN, Amax=0, Tmax=TMIN

ST1020 FILTERING PROCESSING

ST1030 CALCULATE DEGREE OF SIMILARITY A

ST1070 OUTPUT Tmax

END

[FIG.7A]

INTERNAL STATE

[FIG.7B]

ESTIMATED VALUE OF SECOND SPECTRUM D2(k)

[FIG.7E]

SECOND SPECTRUM S2(k)

[FIG.8A]

INTERNAL STATE

[FIG.8B]

ESTIMATED VALUE OF SECOND SPECTRUM D2(k)

[FIG.8E]

SECOND SPECTRUM S2(k)

[FIG.9]

200 SPECTRUM CODING APPARATUS

203 FREQUENCY DOMAIN TRANSFORMATION SECTION

205 INTERNAL STATE SETTING SECTION

208 PITCH COEFFICIENT SETTING SECTION

206 FILTERING SECTION

207 SEARCH SECTION

209 SPECTRAL OUTLINE ADJUSTMENT SUBBAND DETERMINING SECTION

210 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT CODING SECTION

211 MULTIPLEXING SECTION

204 FREQUENCY DOMAIN TRANSFORMATION SECTION

[FIG.10]

INTERNAL STATE (FIRST SPECTRUM S1(k))

ESTIMATED VALUE OF SECOND SPECTRUM D2(k)

[FIG.11]

300 SPECTRUM CODING APPARATUS

303 FREQUENCY DOMAIN TRANSFORMATION SECTION

305 INTERNAL STATE SETTING SECTION

308 PITCH COEFFICIENT SETTING SECTION

306 FILTERING SECTION

307 SEARCH SECTION

313 FILTER COEFFICIENT CALCULATION SECTION

317 SECOND SPECTRUM ESTIMATED VALUE GENERATION SECTION

314 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT CODING SECTION

315 MULTIPLEXING SECTION

304 FREQUENCY DOMAIN TRANSFORMATION SECTION

309 SUBBAND DIVISION SECTION

312 SUBBAND SELECTION SECTION

[FIG.12]

INTENSITY

TO MULTIPLEXING SECTION

FREQUENCY

SUBBAND

[FIG.13]

400 SPECTRUM CODING APPARATUS

403 FREQUENCY DOMAIN TRANSFORMATION SECTION

405 INTERNAL STATE SETTING SECTION

408 PITCH COEFFICIENT SETTING SECTION

406 FILTERING SECTION

407 SEARCH SECTION

413 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT CODING SECTION

414 MULTIPLEXING SECTION

404 FREQUENCY DOMAIN TRANSFORMATION SECTION

409 SUBBAND DIVISION SECTION

412 SUBBAND SELECTION SECTION

[FIG.14]

500 SPECTRUM CODING APPARATUS

503 FREQUENCY DOMAIN TRANSFORMATION SECTION

506 LPC SPECTRUM CALCULATION SECTION

507 SPECTRAL TILT CORRECTION SECTION

511 INTERNAL STATE SETTING SECTION

514 PITCH COEFFICIENT SETTING SECTION

512 FILTERING SECTION

513 SEARCH SECTION

519 SPECTRAL TILT ASSIGNMENT SECTION

510 SPECTRAL TILT CORRECTION SECTION

520 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT CODING SECTION

521 MULTIPLEXING SECTION

504 FREQUENCY DOMAIN TRANSFORMATION SECTION

515 SUBBAND DIVISION SECTION

518 SUBBAND SELECTION SECTION

509 LPC SPECTRUM CALCULATION SECTION

508 LPC ANALYSIS SECTION

[FIG.15]

600 SPECTRUM CODING APPARATUS

603 FREQUENCY DOMAIN TRANSFORMATION SECTION

605 SPECTRUM FLAT PART DETECTION SECTION

606 INTERNAL STATE SETTING SECTION

609 PITCH COEFFICIENT SETTING SECTION

607 FILTERING SECTION

608 SEARCH SECTION

614 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT CODING SECTION

615 MULTIPLEXING SECTION

604 FREQUENCY DOMAIN TRANSFORMATION SECTION

610 SUBBAND DIVISION SECTION

613 SUBBAND SELECTION SECTION

[FIG.16]

700 SPECTRUM CODING APPARATUS

703 FREQUENCY DOMAIN TRANSFORMATION SECTION

705 INTERNAL STATE SETTING SECTION

707 SEARCH RANGE DETERMINING SECTION

708 PITCH COEFFICIENT SETTING SECTION

709 FILTERING SECTION

710 SEARCH SECTION

715 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT CODING SECTION

716 MULTIPLEXING SECTION

704 FREQUENCY DOMAIN TRANSFORMATION SECTION

711 SUBBAND DIVISION SECTION

714 SUBBAND SELECTION SECTION

[FIG.17]

800 HIERARCHICAL CODING APPARATUS

802 DOWNSAMPLING SECTION

803 FIRST LAYER CODING SECTION

804 FIRST LAYER DECODING SECTION

807 MULTIPLEXING SECTION

806 DELAY SECTION

805 UPSAMPLING SECTION

101 SPECTRUM CODING SECTION

[FIG.18]

800a HIERARCHICAL CODING APPARATUS

802 DOWNSAMPLING SECTION

803 FIRST LAYER CODING SECTION

804a FIRST LAYER DECODING SECTION

807 MULTIPLEXING SECTION

806 DELAY SECTION

805 UPSAMPLING SECTION

101 SPECTRUM CODING SECTION

[FIG.19]

1000 SPECTRUM DECODING APPARATUS

1003 SEPARATION SECTION

1005 FREQUENCY DOMAIN TRANSFORMATION SECTION

1006 INTERNAL STATE SETTING SECTION

1007 FILTERING SECTION

1008 SPECTRAL OUTLINE ADJUSTMENT SUBBAND DETERMINING SECTION

1009 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT DECODING SECTION

1010 SPECTRUM ADJUSTMENT SECTION

1011 TIME DOMAIN CONVERSION SECTION

[FIG.20]

DECODED SPECTRUM D(k)

INTERNAL STATE (FIRST SPECTRUM S1 (k))

ESTIMATED VALUE OF SECOND SPECTRUM D2 (k)

[FIG.21]

1100 SPECTRUM DECODING APPARATUS

1102 SEPARATION SECTION

1104 FREQUENCY DOMAIN TRANSFORMATION SECTION

1105 INTERNAL STATE SETTING SECTION

1106 FILTERING SECTION

1107 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT DECODING SECTION

1108 SPECTRUM ADJUSTMENT SECTION

1109 SUBBAND INTEGRATION SECTION

1110 TIME DOMAIN CONVERSION SECTION

[FIG.22]

START

ST2210 PERFORM FREQUENCY TRANSFORMATION ON FIRST SIGNAL AND GENERATE FIRST SPECTRUM S1(k)

ST2220 SET INTERNAL STATE OF FILTER

ST2240 DECODE SPECTRUM OF jTH SUBBAND IN BAND $FL \leqq k < FH$ THROUGH FILTERING

ST2250 ADJUST SPECTRUM OUTLINE OF jTH SUBBAND IN BAND $FL \leqq k < FH$.

ST2280 COMBINE FIRST SPECTRUM AND j SUBBAND SPECTRA

ST2290 CONVERT DECODED SPECTRUM TO TIME DOMAIN SIGNAL

END

[FIG.23]

1200 SPECTRUM DECODING APPARATUS

1202 SEPARATION SECTION

1204 FREQUENCY DOMAIN TRANSFORMATION SECTION

1205 INTERNAL STATE SETTING SECTION

1206 FILTERING SECTION

1210 LPC COEFFICIENT DECODING SECTION

1208 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT DECODING SECTION

1216 LPC SPECTRUM CALCULATION SECTION

1209 SPECTRAL TILT ASSIGNMENT SECTION

1211 LPC SPECTRUM CALCULATION SECTION

1207 SPECTRUM ADJUSTMENT SECTION

1212 SUBBAND INTEGRATION SECTION

1213 TIME DOMAIN CONVERSION SECTION

[FIG.24]

1300 SPECTRUM DECODING APPARATUS

1302 SEPARATION SECTION

1303 COEFFICIENT Tmax GENERATION SECTION

1305 FREQUENCY DOMAIN TRANSFORMATION SECTION

1306 INTERNAL STATE SETTING SECTION

1307 FILTERING SECTION

1308 SPECTRAL OUTLINE ADJUSTMENT COEFFICIENT DECODING SECTION

1309 SPECTRUM ADJUSTMENT SECTION

1310 SUBBAND INTEGRATION SECTION

1311 TIME DOMAIN CONVERSION SECTION

[FIG.25]

1400 HIERARCHICAL DECODING APPARATUS

1402 SEPARATION SECTION

1403 FIRST LAYER DECODING SECTION

1405 UPSAMPLING SECTION

1001 SPECTRUM DECODING SECTION

[FIG.26]

1400a HIERARCHICAL DECODING APPARATUS

1402 SEPARATION SECTION

1403 FIRST LAYER DECODING SECTION

1405 UPSAMPLING SECTION

1001 SPECTRUM DECODING SECTION

[FIG.27]

1502 INPUT APPARATUS

1503 A/D CONVERSION APPARATUS

1504 ACOUSTIC CODING APPARATUS

[FIG.28]

1602 RECEPTION APPARATUS

1603 ACOUSTIC DECODING APPARATUS

1605 OUTPUT APPARATUS

1604 D/A CONVERSION APPARATUS

[FIG.29]

1702 INPUT APPARATUS

1703 A/D CONVERSION APPARATUS

1704 ACOUSTIC CODING APPARATUS

1705 RF MODULATION APPARATUS

[FIG.30]

1803 RF DEMODULATION APPARATUS

1804 ACOUSTIC DECODING APPARATUS

1806 OUTPUT APPARATUS

1805 D/A CONVERSION APPARATUS